

BEFORE THE ENVIRONMENTAL APPEALS BOARD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C.

In re	Teck Cominco Alaska Inc.)
	Red Dog Mine)
)
Permit No.	NPDES)
	AK-003865-2)

PERMITEE'S PETITION FOR REVIEW

Submitted on Behalf of

TECK COMINCO ALASKA INCORPORATED

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for the draft permit occurred on February 6, 2006. Various persons, including the Petitioner herein, commented on that draft.²

On February 12, 2007, the Alaska Department of Environmental Conservation (ADEC) issued a *Certificate of Reasonable Assurance under §401 of the Clean Water Act (2007 Section 401 Certification)*. EPA then renewed the Permit. The Permit is dated March 7, 2007 but it was received by TCAK some time after that and the Permit becomes effective April 12. Construing 40 C.F.R. §124.15 and using Georgia Pacific v. U.S.EPA, 671 F.2d 1235, 1240 (9th Cir. 1982) as a guide, this Petition has been filed within thirty days of the date of Permit Issuance. Accordingly, this Petition is timely.

Additional facts, specific to TCAK's challenge of the "Whole Effluent Toxicity Limit," are set forth in that section.

ISSUES PRESENTED FOR REVIEW

There are thirteen "Topics" identified in the *Table of Contested Conditions*, each of which is correlated to one or more permit conditions. TCAK seeks to have those conditions either (1) administratively corrected from manifest error, or (2) remanded to EPA with instructions to revise the conditions consistent with this tribunal's decision.

ARGUMENT

WHOLE EFFLUENT TOXICITY LIMITS Permit Conditions I.A.1, Table 1 and I.G

The WET Limits Established By EPA Are Fundamentally Flawed In Two Material Respects

Summary

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² TCAK Exhibit 1, *Comments on Teck Cominco Incorporated (TCAK) Red Dog Mine February 2, 2006 Draft NPDES Permit* (March 2006)

Permit Conditions I.A.1 and I.G. impose two Whole Effluent Toxicity (**WET** or **Chronic Toxicity**) limitations on effluent from Red Dog Mine. The allowable daily maximum concentration is 12.2 chronic toxic units (**TUc**) while the monthly average may not exceed 9.7 TUc. EPA's inclusion of these limits is clearly erroneous for two reasons.

First, the condition predicate to inclusion, a reasonable potential that mine discharges could make receiving waters more toxic to aquatic life, has not been met. The receiving waters at issue are naturally high in toxicity. Undisputed evidence has demonstrated, beyond a reasonable doubt, that mine operations have actually reduced toxicity in the receiving water compared to a pre-mining baseline. There is no reasonable potential for mine discharges to increase aquatic toxicity above natural background. Therefore, EPA is without authority to impose toxicity limits on the discharge from Red Dog Mine.

Second, EPA has renewed precisely the same toxicity limits that were derived in 1998 using a water balance model. Refinement of data input for the model clearly establishes that the 1998 limits were predicated upon mistakes of fact (flawed input). It is irrational to adhere to demonstrated error.

A third error is procedural. EPA contends that it cannot now run the water balance model to derive factually correct output except through a process used when establishing a site-specific water quality criterion. That process was not required in 1998 and it is not required today.³

Statement of Material Facts

Natural Toxicity

Red Dog Creek has several tributaries. There are North, South, and Middle Forks.⁴

³ TCAK addressed these matters in its comments. See, TCAK Exh. 1 at page 37: "There are no regulatory impediments to eliminating the WET limits for both species from the NPDES Permit" and "Permitting flexibility is legally appropriate given the site-specific evidence of no toxicity to the invertebrate community of Red Dog and Ikalukrok Creeks."

These combine to form Red Dog Creek's "Main Stem" which flows into Ikalukrok Creek. Downstream, when Ikalukrok joins Tulak Creek, they become Wulik River. The River flows into the Chukchi Sea near the town of Kivalina.

The 1984 EIS was prepared prior to commencement of mining operations. It described the Mainstem of Red Dog Creek as "very toxic."⁵ Concentrations of cadmium, lead, silver, and zinc were present in the water and concentrations of aluminum, chromium, mercury and nickel exceeded EPA criteria for aquatic life.⁶ Baseline water quality characteristics at the mouth of Red Dog Creek showed those waters to be "toxic to fish during the summer."⁷ Benthic invertebrates were "severely stressed."⁸

A 1996 letter from EPA Region X described the pre-mining condition of Red Dog Creek's Main Stem as "natural fish kills, in-situ fish kills and severe impacts to the benthic communities."⁹ EPA's recent Response To Comments again acknowledges that "receiving waters exhibit background toxicity related to naturally high concentrations of [a variety of] toxins. . . ."¹⁰ In recognition of this natural condition, ADEC removed the aquatic and wildlife use designation for some of the stream segments in the watershed where Red Dog Mine is located. Those stream segments were too polluted by natural

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⁴ See Pre-Mining Maps, **TCAK Exhibit 2** at pages 13-14. Exhibit 2 is the *State of Alaska Department of Environmental Conservation Certificate of Reasonable Assurance, Red Dog Mine Site* (July 22, 1998) referred to herein as (1998 Section 401 Certification)

⁵ USEPA/DOI 1984 at page IV-30. The EIS has been incorporated into the current administrative record by the Environmental Assessment prepared for this permit renewal. EPA, *Environmental Assessment, Red Dog Mine Project NPDES Permit Renewal* (January 2006) (**2006 EA**) at pages 6, 7, 8

⁶ *Id.*

⁷ EIS at page IV-36

⁸ EIS at page IV-30

⁹ December 18, 1996 letter from Kathleen Collins (EPA Region 10) to Charlotte MacCay (Teck Cominco, formerly Cominco), referenced and quoted in TCAK Exh. 1 at page 29

¹⁰ RTC #131, page 58

contaminants to support these uses.¹¹ The general consensus was that, before mining commenced, natural toxicity in Red Dog Creek and its tributaries severely inhibited growth or propagation of aquatic invertebrates and those waters were largely devoid of fish.¹²

Improvements To Water Quality

Many of the toxics that historically prevented aquatic communities from thriving were naturally occurring metals. Prior to mining, the Middle Fork of Red Dog Creek flowed directly over heavily mineralized rock. The creek also received surface and groundwater drainage from an orebody that contained high metal and sulfide concentrations.¹³ Oxidation of metal sulfide mineralization led to elevated concentrations of metal sulfates in the water.¹⁴ This natural occurrence of metal mineralization is the very reason a mine was constructed at this location.

In an irony explained below by "Water Balancing," the indigenous invertebrate community of these streams is now thriving because mine operations capture much of the water before it contacts the ore body and because mine personnel treat that appropriated water to substantially reduce metals otherwise present. Mining operations have reduced toxicity in Red Dog Creek...

As part of the process for renewing this Permit, EPA conducted an Environmental

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¹¹ See, 2007 Section 401 Certification at 9, discussing why the State's toxicity criteria for aquatic life, 18 AAC 70.020(b)(11)(C) and 70.030, do not apply.

¹² See also, 1998 Section 401 Certification at Appendix B, *Whole Effluent Toxicity*, (1998 Water Balance) at B-1.

¹³ The 1998 Section 401 Certification was incorporated by reference into, and made a part of, this Administrative Record by, *inter alia*, 2007 Section 401 Certification at Appendix C, *Updated Water Balance and WET Limit Calculations* (Feb. 12, 2007)(**Updated Water Balance**)

¹⁴ EIS at page IV-36

¹⁵ 1998 Section 401 Certification at page 3

¹⁶ 2006 EA at page 12

Assessment (EA).¹⁵ Concentrations of metals in Red Dog Creek have been reduced from pre-mining levels.¹⁶ The EA noted "overall improvements in water quality, increased primary production and increased numbers and diversity of benthic invertebrates."¹⁷ Since mine development, grayling have been known to spawn in Mainstem Red Dog Creek."¹⁸ Grayling Fry hatch in late June and rear in Mainstem Red Dog Creek...."¹⁹

Foremost experts on the biological community of Red Dog Creek agree that the Mainstem is less toxic now than in its pre-mining condition.²⁰ Phyllis Scannell, an Alaska governmental specialist in water quality, prepared a report entitled *Comparison of Mainstem Red Dog Creek Pre- and Post- Mining*.²¹ She noted overall improvements in water quality and aquatic life.²² "Before" and "After" photographs of the Red Dog Creek clearly show the beneficial effect of mining activity.²³ In 1982, before mining operations commenced, the stream is red with natural toxicity. By June, 2005, water is visibly improved and the formerly denuded riparian area is green with vegetation.

Phyllis Scannell documented the beneficial effects on aquatic invertebrates:

As with *periphyton* communities, aquatic invertebrate communities in Red Dog Creek show no indication that they have been reduced, either in density or taxonomic richness, by the current water quality conditions in Mainstem Red Dog

¹⁵ See note 5, *supra*.

¹⁶ 2006 EA at page 13

¹⁷ *Id.* at page 16

¹⁸ *Id.* at page 15-16

¹⁹ *Id.* at page 16. See also, TCAK Exh. 1 at 27-28

²⁰ These letters were appended to TCAK's Comments when those comments were submitted to EPA. They are part of TCAK Exhibit 1: Letters and reports from Dr. Alvin Ott (ADNR-OHMP), Dr. Phyllis Scannell (ADF&G - retired), Dr. Jonathan Houghton (formerly Dames and Moore).

²¹ **Scannell Comparison** (March 11, 2005). This is one of the attachments to TCAK Exh. 1

²² *Id.* at page 18 of the Report, "Summary of Characteristics" of the Waterbody

²³ TCAK Exh. 1 at page 34. "RDC" stands for Red Dog Creek. MS = MainStem MF=Middle Fork NF=North Fork

Creek. In fact, the aquatic communities in 1995-2002 are in sharp contrast to communities during baseline when few, or no invertebrates were found.²⁴

EPA, Region X, also acknowledges these improvements, stating: "[W]ater quality and aquatic life conditions in Mainstem Red Dog Creek have improved from pre-mining conditions, particularly during the last five years."²⁵ The entire body of available scientific data unequivocally establishes that Red Dog Creek is less toxic now than it was before mining commenced.²⁶

Water Balancing

There is absolutely no doubt about this fact: improvement in water quality is the direct result of TCAK's Water Management System. Red Dog Creek is cleaner now because TCAK captures a substantial portion of the creek's flow before that water comes into contact with mineralized ore. The mine completely captures all of the South Fork as well as a portion of the historical flow from the Middle Fork.²⁷ In addition, the mine captures precipitation runoff before it can enter the mineralized zones. This creek water and surface runoff are diverted into the Mine's Water Management System.²⁸ TCAK treats much of that water to reduce metals and other constituents.²⁹ Also, the collection of clean precipitation adds to the water volume and reduces the concentration minerals overall.³⁰

When this treated effluent and collected precipitation is discharged it "dilutes the naturally occurring metals in Red Dog Creek, moderates the pH, and lessens the toxicity of

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²⁴ Scannell, *Justification for Modified TDS Limits in Red Dog Creek and Ikalukrok Creek* (July 4, 2003)(**Scannell Justification**) at page 22 . Scannell's Report was, and is, attached to TCAK's Comments. TCAK Exh. 1

²⁵ RTC #8 at page 5

²⁶ E.g., 2007 Section 401 Certification at Appendix A, page A-7

²⁷ 1998 Water Balance at B-2

²⁸ 1998 Section 401 Certification at page 3; 2006 EA at page 12

²⁹ *Id.*

³⁰ Scannell Comparison at 18

metals by increasing the hardness."³¹ During the discharge season, as much as forty percent of the flow in the Middle Fork of Red Dog Creek comes from the Red Dog wastewater treatment plant. This treated effluent is less toxic than the ambient receiving water.³²

Consequently, it is now widely recognized that the aforementioned improvements to stream quality are attributable to TCAK's water management practices.³³ EPA's recent Environmental Assessment unequivocally confirms that increased numbers and diversity of benthic invertebrates and other aquatic life are a direct consequence of better water quality due to mine operations and resulting effluent discharges that cleaned up natural stream toxicity. Rather than making the receiving streams more toxic, mine operation and discharges have made the receiving streams less toxic to aquatic invertebrates.³⁴

This situation was not so clear in 1998. Although anecdotal evidence suggested that water quality was improving, much of the study and documentation has been conducted in the intervening years. And, ADEC was conflicted. Effluent was discharged into the Middle Fork of Red Dog Creek which, because of its pre-mining toxicity, was not protected for aquatic life.³⁵ On the other hand, the far reaches of the Main Stem and the waters of Lower Ikluok Creek were so protected. In an exercise of caution, ADEC thought it prudent to apply a WET limit to the mine's effluent while simultaneously predicting that "when this draft permit is reissued in five years, [it may be that] we will have enough confidence in our biological monitoring that we can dispense with WET limits altogether."³⁶

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³¹ Id.

³² RTC #130, page 56

³³ Scannell Justification at page 13

³⁴ See, TCAK Exh. 1 at pages 26-27, 44-46. See also 2007 Section 401 Certification, Appendix A, *Cadmium Natural Condition Based Site Specific Criterion*, at pages A-3, A-4, A-7, A-8, A-12 thru A-14

³⁵ 1998 Water Balance at page B-1

³⁶ Id. and at B-9

ADEC set out to determine what limit should apply. Because "the mine's effluent essentially replaces the historic flow" of several tributaries, ADEC reasoned that the waters to be protected would be protected so long as the effluent did not contribute more toxicity to the Receiving Streams than had been historically contributed by the natural flows the mine was now capturing.³⁷ ADEC then set about calculating the volume and toxicity of those captured waters so that the agency could "balance" the mine's discharge with historical toxicity loading.

Another variable was imposed by federal New Source Performance Standards. Under 40 C.F.R. Part 440, Red Dog Mine could not discharge collected precipitation except to the extent that collected precipitation exceeded annual evaporation.³⁸ A complex *Water Balance Model for the Red Dog Mine* was developed. Modelers estimated pre-mining toxicity in each relevant stream segment and estimated or calculated historical flow for each segment.³⁹ They estimated precipitation and evaporation. All of these variables were put into the model, statistically manipulated with a "Waste Load Allocation" and a "reasonable potential" analysis, then reduced to end-of-pipe toxicity limits roughly approximating the toxic loading that had existed pre-mining.⁴⁰ The end result was "daily maximum" and "monthly average" chronic toxicity limits of 12.2 and 9.7 TUc, respectively.⁴¹

Almost immediately thereafter, TCAK set about gathering more data to refine the variables used in the Water Balance Model. And, importantly, TCAK annually conducted field

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³⁷ *Id.* at B-2; RTC #130 at page 56

³⁸ 40 C.F.R. 440.12(c)(2):

In the event that the annual precipitation falling on the treatment facility and the drainage area contributing surface runoff to the treatment facility exceeds the annual evaporation, a volume of water equivalent to the difference between annual precipitation falling on the treatment facility and the drainage area contributing surface runoff to the treatment facility and annual evaporation may be discharged subject to the limitations set forth in paragraph (a) of this section.

³⁹ 1998 Water Balance at page B-3. Updated Water Balance at page C-1.

⁴⁰ 1998 Water Balance at B-3 through B-9

⁴¹ *Id.* at B-8

assessments of the aquatic biota (**bio-assessments**) in water downstream from the Red Dog Mine.⁴² This work was joined by an Environmental Assessment in 2003 when the permit was modified with a site-specific criterion for Total Dissolved Solids (**TDS**).⁴³ At that time, EPA Region X concluded that, so long as the mine's permit had effluent limitations for TDS and other parameter-specific, water-quality-based limitations, the bio-assessments confirmed that invertebrates in the receiving streams were actually benefited by mine operations.⁴⁴

Recent Statutory Background

During the past year, ADEC has once again been studying the situation at Red Dog Mine so that ADEC could meet its obligations under Section 401 of the Clean Water Act. As this tribunal knows, all NPDES permit applicants must obtain a certification from the appropriate state agency validating the permit's compliance with the pertinent federal and state water pollution control standards. These validations are generally known as "Section 401 Certifications." In re Teck Cominco I, 11 EAD at 470 n. 15

After reviewing almost a decade's worth of bio-assessments and additional data with respect to the 1998 Water Balance, ADEC made two critical determinations in 2007:

- (1) No WET limit should be included in the permit because "18 AAC 70.020(b)(11)(C) and 18 AAC 70.030 do not apply at the point of discharge and that the bio-monitoring program is ultimately more meaningful than WET testing" and "the department finds there is not reasonable potential for the toxicity of the effluent to exceed the toxicity of the receiving water in its natural condition....";⁴⁵

and

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⁴² TCAK Exh. 1 at 24-25, 32-33, 35-36, 42-43 etc.

⁴³ The topic of Teck Cominco I, 11 EAD 457

⁴⁴ 2003 Environmental Assessment, prepared by EPA for the Red Dog Mine Project NPDES Permit Modification (January 2003) (**2003 EA**) at pages 27- 29.

⁴⁵ 2007 Section 401 Certification at pages 9, 10

- (2) If EPA does include WET limits in the 2007 permit based on the Water Balance Model, EPA should employ the updated water balance information which more accurately accounted for the source of, the quantity of, and the pre-mining toxicity of the water inflows to the mine.⁴⁶

TCAK joined ADEC in this regard, asking EPA to either eliminate the WET Limit or, at a minimum, to refine the chronic toxicity limitations in the renewed permit in light of the improved water balance information.⁴⁷

EPA declined to take either action. In response to the request that limits be eliminated, the federal agency thought it "necessary and appropriate to set WET limits to ensure that the treated effluent does not increase the in-stream toxicity in the receiving system."⁴⁸ EPA relied upon the fact that Whole Effluent Toxicity had been observed in the effluent from this facility.⁴⁹ EPA asserted its belief that there is no "solid basis" for the argument that the effluent is less toxic than the natural condition in the creek.⁵⁰

In response to the request that limits be adjusted to reflect updated Water Balance information, EPA acknowledged that the WET limits had originally been "tailored" to this facility⁵¹ and that there was "validity" to the issues raised by TCAK and Geomatrix (developer of the water balance model) regarding "inconsistencies between actual and measured precipitation and evaporation rates." EPA even went so far as to acknowledge that such inconsistencies "have been well-documented at sites throughout the country."⁵² Nonetheless, EPA was unwilling to apply the updated facts because EPA had not reviewed some of the new

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⁴⁶ Id. and Updated Water Balance at C-2 thru C-5

⁴⁷ TCAK Exh. 1 at pages 11 - 48

⁴⁸ RTC #130 at 56

⁴⁹ RTC #134 at 60

⁵⁰ RTC # 135 at page 60

⁵¹ RTC #133 at page 59

⁵² RTC #136 at page 62

flow data and because EPA contended that the new information could not be used in the permit but, rather had to be part of a new site specific criterion.⁵³

This appeal followed

Argument

No Chronic Toxicity Limits May Be Imposed In This Permit Without A Prerequisite Finding That Red Dog Mine Operation and Effluent Have Reasonable Potential To Cause or Contribute To An Excursion of a Water Quality Standard

Water Quality Standards consist of water quality criteria and designated uses.⁵⁴ EPA is authorized to impose water-quality-based WET Limits in a permit when EPA determines that the permittee's discharge causes, or has the reasonable potential to cause, or contributes to, an in-stream excursion above an applicable numeric criterion or above an applicable narrative criterion.⁵⁵ There are no other legal authorities on which EPA may base WET limits in the subject permit. Absent "reasonable potential" to bring about an excursion, Red Dog Mine's effluent may not be subjected to a WET permit limit.

Alaska has both numeric and narrative toxicity criteria.⁵⁶ As with any water quality criteria, they are made applicable to stream segments depending on the use being made of that segment's waters.⁵⁷ These criteria are designed to protect organisms and, because there were no humans and few aquatic species existing in or on the water of Red Dog Creek's Middle Fork in the years before mining began, neither of Alaska's toxicity criteria apply to that stream segment.

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⁵³ Id.

⁵⁴ In re Hecla Mining Co., Lucky Friday Mine, 13 EAD 1, 6 (Oct. 31, 2006). Antidegradation, the third component, is not here at issue because antidegradation policies are not implicated when a discharger improves the natural water quality of its receiving water. 1998 Section 401 Certification at 1.

⁵⁵ 40 C.F.R. §122.44(d)(1)(iv), (v)

⁵⁶ 18 AAC 70.020(1)(C)(narrative) and 70.030(numeric)

⁵⁷ In re Hecla, 13 EAD at 6